



Preparing for E85

A Guide for Gas Station Owners

Michigan Department of Environmental Quality • 800-662-9278 • www.michigan.gov/deq

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OVERVIEW

E85 is the term for motor fuel blends of 85 percent ethanol and 15 percent gasoline to be used in Flexible Fuel Vehicles. There are over fifty E85 pumps in Michigan, making the fuel widely available to consumers. Several other E85 pumps are in the planning stages throughout the state. This guide is designed to help gas station owners understand what's involved with converting storage tank systems to E85.



Photo courtesy of the Michigan Energy Office, Department of Labor and Economic Growth

THINGS TO THINK ABOUT BEFORE CONVERTING TO E85

Compatibility: If you would like to convert your existing gasoline or diesel fueling systems for use with E85, you must verify that all parts of the storage tank system are compatible with ethanol. The storage tank system includes the dispenser, piping, and the tank. Without converting to adequate equipment, your underground storage tank system (USTs) could degrade, and a product release could occur.

Soft metals, such as zinc, brass, or aluminum, which are commonly found in conventional fuel storage and dispensing systems, are not compatible with E85. Some nonmetallic materials may also degrade when in contact with ethanol. These include natural rubber, polyurethane, adhesives (used in older fiberglass piping), certain elastomers and polymers used in flex piping, bushings, gaskets, meters, filters, and materials made of cork. In order to store and dispense E85, fiberglass and steel USTs and components must be certified by the manufacturer for use with E85.

Water Issues: Ethanol blends well with gasoline, but it is also completely miscible (mixable) in water. When water infiltrates a tank, (e.g., through sump covers and loose fittings at the top of the tank), the ethanol in the E85 blend will absorb the water, which, if enough is present, will overwhelm the ethanol's capacity to remain blended with the gasoline. Because it mixes easier with water, the ethanol will be drawn from the gasoline into the water at the bottom of the tank, and separate from the gasoline. Then, the product in the tank is no longer a blend of ethanol and gasoline, but two layers of a product – a layer of gasoline on top and an ethanol layer on the bottom, referred to as “phase separation.” At this point, you're not getting an ethanol blend anymore, but a greater concentration of either ethanol or gasoline. Phase separation can be a problem for vehicles' fuel lines, as the product is no longer an ethanol blend.

Corrosion and Conductivity: Ethanol can accelerate corrosion in steel USTs by scouring or loosening deposits on the internal surfaces of tanks and piping. If a corrosion cell exists, the ethanol can scour the corrosion cell and cause a perforation. As mentioned before, ethanol is not compatible with soft metals, such as zinc, brass, copper, lead, and aluminum. These metals will degrade or corrode in contact with ethanol and possibly contaminate a vehicle's fuel system.

Tank leak detection equipment composed of certain metals like those mentioned earlier (polymers and elastomers) may not be compatible with ethanol. Because ethanol has a higher conductivity than gasoline, capacitance probes will not work in E85 fuels. You should verify that the floats used in magnetostrictive probes are alcohol compatible and that the Automatic Tank Gauging (ATG) system is properly calibrated for ethanol.

Vapor Recovery: Since E85 does not meet the definition of "gasoline" per the Michigan Administrative Rules for Air Pollution Control, USTs containing E85 are not subject to Stage I vapor recovery requirements. For more information about Stage I vapor recovery, go to www.michigan.gov/deqair, click on "Clean Air Assistance" and scroll down to "Stage I."

STARTING THE PROCESS OF CONVERTING TO E85

The conversion to E85 fuel requires time and effort to evaluate existing equipment, verify compatibility, and order ethanol compatible equipment. Following is a list of steps to take to begin the process of converting to E85.

Check for Leaks: No level of water is acceptable for E85 fuel, due to phase separation problems. You will need to make certain all fittings and connections at the top of the tank are tight (no vapors escape and no water enters) and that all sump and spill containment covers prevent water from entering. Any water intrusions must be fixed.

Clean the Tank: After any water problems have been fixed, you must clean the tank dedicated to E85 to remove all sludge from the bottom of the tank. Any sludge or particulates in the bottom of the tank will be suspended in the ethanol and cause problems with filters and fuel lines. You must notify the Michigan Department of Environmental Quality (DEQ), Waste and Hazardous Materials Division (WHMD), Storage Tank Unit in Lansing and your local DEQ district Hazardous Materials Storage Inspector (HMSI) (district map located at the end of this document) 30 days before you clean your tank. After the tank is cleaned, obtain a *Clean Tank Certificate* or similar documentation from the certified tank cleaner company.

Evaluate Existing Equipment: The USTs should be inspected by a qualified, knowledgeable installer-inspector after the tank system has been cleaned. Storage tank manufacturers recommend that the inspection includes a visual examination of the interior of the tank. E85 is more likely than other petroleum products to cause debris to be suspended in your tank. You should ask the inspector if the USTs would be better protected and operate smoother by installing additional filters and screens to the system. Your local DEQ HMSI can help you to locate an installer - inspector in your area.

The following equipment/components/materials must be compatible with the E85 you intend to store and dispense:

- Fill pipe
- Spill prevention
- Drop tube
- Overfill/Auto shut-off
- Tank
- Gaskets
- Bushings
- Couplings
- Piping
- Pipe sealant/adhesive
- Flex connectors
- Sump
- Grommets/boots
- Submersible pump/pump impeller
- Leak detection
 - Probe
 - Float
 - Sensors
- Dispenser
 - Gaskets
 - Filters
 - Piping
 - Hoses
 - Nozzle
 - Swivel
 - Pump/meter

A list of E85 compatible equipment available for purchase can be found at <http://resource.pei.org/altfuels/guide.asp>.

Register with DEQ: Per the requirements of the Michigan Underground Storage Tank Rules (MUSTR), owner/operators that convert existing petroleum USTs over to dispensing E85 are required to submit an amended [registration form](#) to DEQ's Waste and Hazardous Materials Division, Storage Tank Unit. For copies of the registration form, go to the Storage Tank Information Center at www.deq.state.mi.us/sid-web/.

Label: Fill pipe and access covers must be properly identified so truck drivers deliver E85 to the correct tank. Dispensers must have a sign that prominently states "For Flexible Fuel Vehicles Only."

Get Proper Insurance: Federally regulated USTs are required to have financial responsibility (FR). The most common mechanism for FR is liability insurance. Insurance writers assess the FR coverage on product, type of system, age of tanks, overall risk, etc. Owners considering converting to ethanol blends above 10% ethanol should consult with their FR provider prior to committing to the actions and costs associated with preparing a tank for ethanol blended fuels.

Secure Funding: The Energy Policy Act of 2005 created an Alternative Fuel Infrastructure Tax Credit that permits taxpayers to claim a 30% credit, up to \$30,000, for the cost of installing clean-fuel (includes E85) vehicle refueling property to be used in a trade or business of the taxpayer or installed at the principal residence of the taxpayer. The credit applies to property placed in service between December 31, 2005 and December 31, 2009. There is also an incentive available from the Michigan Department of Labor and Economic Growth (DLEG) Energy Office, which may cover 50% of the cost up to \$5,000 of eligible expenditures. Applications will be taken from February 1, 2008, through December 19, 2008. For more information, contact the Energy Office at 517-241-6281.

FIRST DELIVERY AND ONGOING MAINTENANCE

1. Follow normal delivery procedures for the first delivery of E85 blend. The Renewable Fuels Association (RFA) recommends filling the tank to 80 percent capacity and to keep the tank at that volume for 7 to 10 days.
2. As soon as product stabilizes, a tightness test (0.1 gph leak rate) is recommended using your ATG system to make sure your system is tight and the leak detection equipment is operating properly. Report any "Fail" results to the DEQ WHMD Storage Tank Unit in Lansing and your local DEQ district HMSI.

3. You must test for water at the beginning of each shift for the first 48 hours after delivery. Checking for water regularly is a part of the ongoing maintenance with ethanol storage. Ethanol compatible water detect paste must stay in contact with the product for the time specified by the manufacturer. This is generally a period of 10 to 30 seconds.
4. Dispenser fuel filters may have to be changed at more frequent intervals during the first few months of storage.

SAFETY CODES

The regulatory standards for handling and storing E85 are the same as those for gasoline. The DEQ has adopted the National Fire Protection Association (NFPA) year 2000 edition standards that apply to fuel ethanol blends: NFPA 30, “Flammable and Combustible Liquids Code,” and NFPA 30A, “Automotive and Marine Service Station Code.” The copyrighted standards are available by contacting the NFPA at www.nfpa.org or by dialing (800) 344-3555. The Michigan specific rules are available online at www.michigan.gov/deqwhmd. Click on the “Storage Tanks,” then “Underground storage tanks.” Finally, scroll to the Laws and Rules section, and click on “Flammable and Combustible Liquids (FL/CL).”

USTs are governed by an additional set of rules, the Michigan Underground Storage Tank Rules (MUSTR). The rules are available online following the above instructions to get to the storage tank web page. Click on “MUSTR” in the Laws & Rules section.

SPILLS AND RELEASES

E85 spills and releases are handled like a gasoline release. If a leak from the tank system or other contamination is confirmed from routine maintenance, site assessment, soil sampling, or other activity, a release must be reported to the DEQ. The owner/operator or the station personnel must fax or email a confirmed release report, on the “Release Report: Suspected/Confirmed ([EQP3826](#))” form, to the WHMD within 24 hours of the discovery. The release can also be reported to the local DEQ district office, Remediation and Redevelopment Division (RRD). If the leak has created an emergency situation, call the [Pollution Emergency Alerting System \(PEAS\)](#) at (800) 292-4706. The Environmental Assistance Program, (800) 662-9278, can help by providing the district office number and transferring the caller to the appropriate division and staff.

The DEQ would like to thank the Wisconsin Department of Commerce for use of the fact sheet - [Preparing Your Dispensing System For Ethanol Blended Motor Fuel](#) in preparing this document.

SOURCES

- Wisconsin Department of Commerce – www.commerce.wi.gov
- U.S. Department of Energy, Alternative Fuels Data Center, E85 Fleet Toolkit – www.eere.energy.gov/afdc/e85toolkit/
- National Ethanol Vehicle Coalition – www.e85fuel.com
- Renewable Fuels Association – www.ethanolrfa.org/
- National Fire Protection Agency – www.nfpa.org
- DEQ Storage Tank website – www.michigan.gov/deqland, click on “Storage Tanks,” then click on “Underground Storage Tanks”
- Department of Labor and Economic Growth, Energy Office, www.michigan.gov/energyoffice

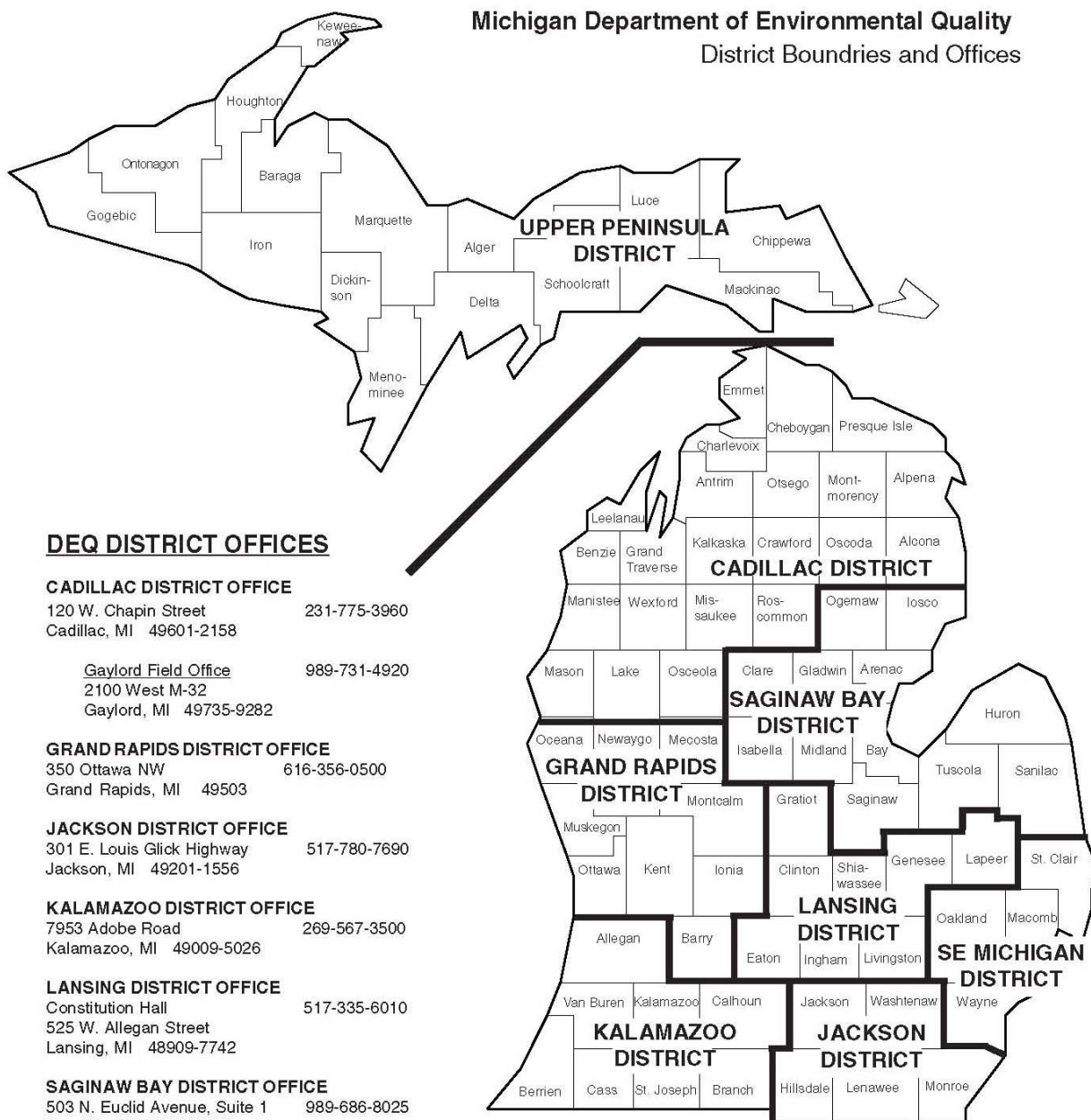
CONTACT INFORMATION

Environmental Assistance Program – (800) 662-9278

Waste and Hazardous Materials Division, Storage Tank Unit – (517) 335-2690

DEQ DISTRICT MAP

Michigan Department of Environmental Quality
District Boundries and Offices



DEQ DISTRICT OFFICES

CADILLAC DISTRICT OFFICE

120 W. Chapin Street
Cadillac, MI 49601-2158

Gaylord Field Office 989-731-4920
2100 West M-32
Gaylord, MI 49735-9282

GRAND RAPIDS DISTRICT OFFICE

350 Ottawa NW 616-356-0500
Grand Rapids, MI 49503

JACKSON DISTRICT OFFICE

301 E. Louis Glick Highway 517-780-7690
Jackson, MI 49201-1556

KALAMAZOO DISTRICT OFFICE

7953 Adobe Road 269-567-3500
Kalamazoo, MI 49009-5026

LANSING DISTRICT OFFICE

Constitution Hall 517-335-6010
525 W. Allegan Street
Lansing, MI 48909-7742

SAGINAW BAY DISTRICT OFFICE

503 N. Euclid Avenue, Suite 1 989-686-8025
Bay City, MI 48706-2925

SOUTHEAST MICHIGAN DISTRICT OFFICE

27700 Donald Court 586-753-3700
Warren, MI 48092-2793

Detroit Field Office 313-456-4700
Cadillac Place
3058 West Grand Boulevard, Suite 2-300
Detroit, MI 48202-6058

UPPER PENINSULA DISTRICT OFFICE

420 5th Street 906-346-8300
Gwinn, MI 49841

ENVIRONMENTAL ASSISTANCE CENTER

(for general information):

Telephone: 800-662-9278
Fax: 517-241-0673

POLLUTION EMERGENCIES

Telephone: 800-292-4706

DEQ WEB PAGE

www.michigan.gov/deq

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